

(19) World Intellectual Property
Organization
International Bureau



(43) International Publication Date
17 February 2005 (17.02.2005)

PCT

(10) International Publication Number
WO 2005/015061 A1

(51) International Patent Classification⁷: **F16H 61/00**,
15/38 // 101:04

[GB/GB]; 12A Bushell Place, Preston, Lancashire PR1
3TQ (GB).

(21) International Application Number:
PCT/GB2004/002500

(74) Agent: **W.P. THOMPSON & CO.**; Coopers Building,
Church Street, Liverpool L1 3AB (GB).

(22) International Filing Date: 15 June 2004 (15.06.2004)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
0317499.2 25 July 2003 (25.07.2003) GB

(71) Applicant (for all designated States except US): **TORO-
TRAK (DEVELOPMENT) LIMITED** [GB/GB]; 1 As-
ton Way, Leyland, Lancashire PR5 3UX (GB).

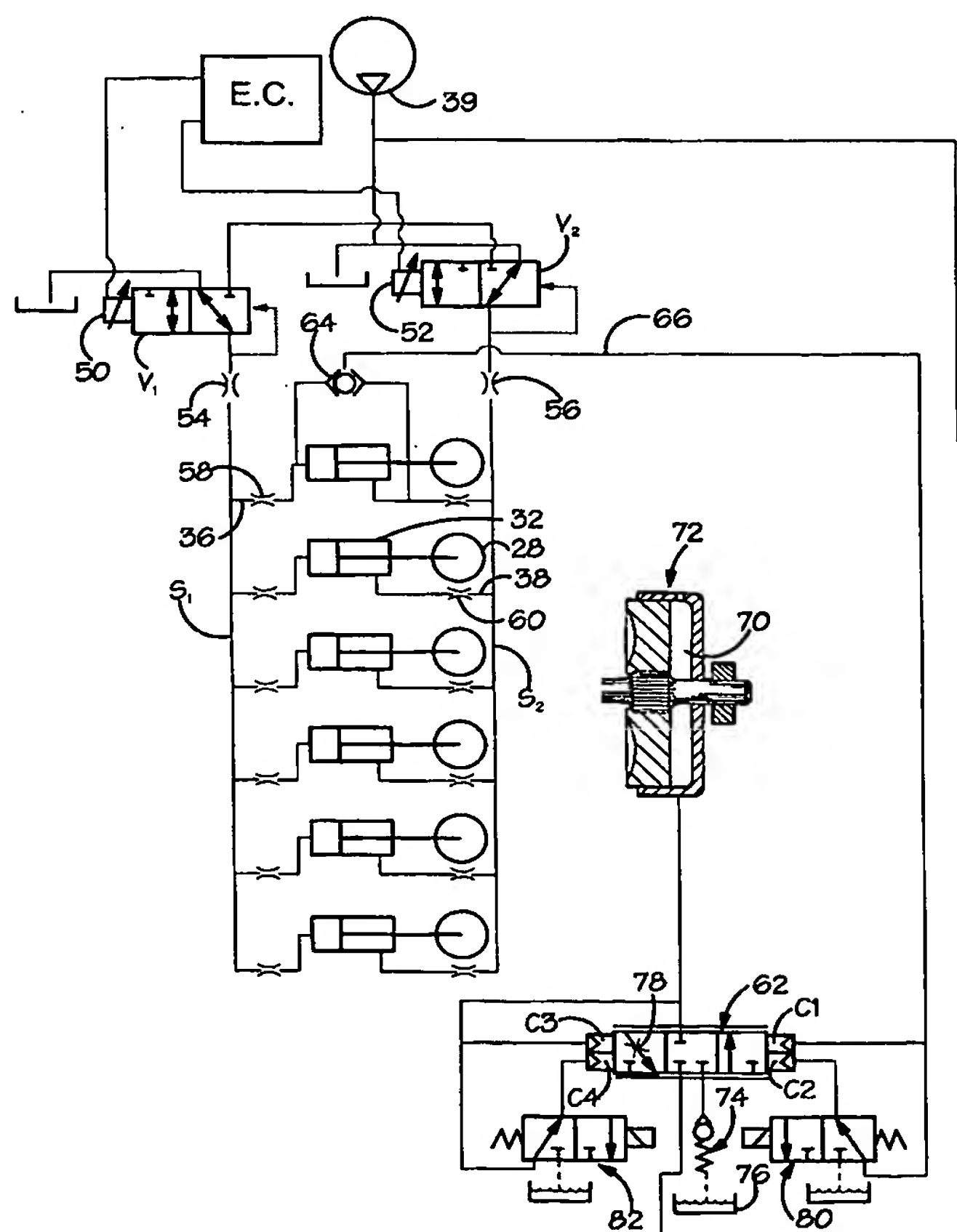
(81) Designated States (unless otherwise indicated, for every
kind of national protection available): AE, AG, AL, AM,
AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN,
CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI,
GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE,
KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD,
MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG,
PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM,
TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM,
ZW.

(84) Designated States (unless otherwise indicated, for every
kind of regional protection available): ARIPO (BW, GH,
GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM,

[Continued on next page]

(72) Inventor; and
(75) Inventor/Applicant (for US only): **FULLER, John**

(54) Title: **HYDRAULIC VARIATOR CONTROL ARRANGEMENT**



(57) Abstract: In a continuously-variable-ratio-device ("variator") of the type having races (12, 14, 26, 102) between which drive is transferred by rollers (28) which are movable in accordance with changes of variator ratio, it is necessary to apply a traction load urging the rollers and races into engagement. Each rollers is also subject to a transverse reaction force by a hydraulic reaction roller actuator (32) receiving a i controlled reaction pressure. It is desirable to create a relationship between traction and reaction force, and also to provide for adjustment of this relationship. In the present invention this is achieved hydraulically. A traction pressure related to the reaction pressure is applied to an actuator (72, 100) which creates the traction load. The hydraulics also include a working chaniber (C2, C4, CH1, CH2, CH3) which is selectively connectable to and disconnectable from either (or both) of (i) the reaction pressure and (ii) the traction pressure, the traction force being dependent upon pressure in the working chamber.



ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM),
European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI,
FR, GB, GR, HU, IE, IT, LU, MC, NL, PL, PT, RO, SE, SI,
SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ,
GW, ML, MR, NE, SN, TD, TG).

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

Published:

— *with international search report*